

REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, claims 1, 2 and 6 are amended and claim 7 is newly added. Support for the amendments to claims 1-2 and 6 and new claim 7 may be found throughout the original description of the present patent application. No new matter has been added. Accordingly, after entry of this Amendment, claims 1-7 will remain pending in the patent application.

Claims 1-6 were rejected under 35 U.S.C. §101 as allegedly being directed to a non-statutory subject matter. The rejection is respectfully traversed.

In connection with this rejection, the Examiner indicated that “merely ‘inspecting’ would not appear to be sufficient to constitute a tangible result.” Without taking a position with respect to the merit or substance of this rejection, Applicant has amended claims 1 and 6 to change the recitation “inspecting the insulating layer with the library” with “detecting a defect in the insulating layer with the library.” It is respectfully submitted that the amendments to claims 1 and 6 obviate the claim rejection. Specifically, it is respectfully submitted that the act of “detecting a defect in the insulating layer with the library” does constitute a tangible result.

Claims 2-5 are patentable at least by virtue of their dependency from claim 1.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-6 under 35 U.S.C. §101 are respectfully requested.

Claims 1-6 were rejected under 35 U.S.C. §103(a) based on Ledger (U.S. Patent No. 5,365,340) in view of Yagi (U.S. Patent No. 5,899,792). The rejection is respectfully traversed.

Claim 1 recites a method for inspecting an insulating layer deposited or planarized on a substrate in fabrication processes of semiconductors with a library of optic images, the method comprising, *inter alia*, measuring thickness data of the insulating layer; collecting standard data for an optic image of the insulating layer; making a library by matching the measured thickness data and the optic image collected on a same location on the substrate. Applicant respectfully submits that Ledger is silent as to a method including these features.

Ledger discloses a method for determining the thickness of the outer layer of a wafer by using reflectance data. (*See, e.g.*, col. 4, lines 25-29 of Ledger). The method of Ledger includes calculating spectral reflectances for a plurality of thicknesses of the outer layer and

comparing the calculated reflectances with the measured reflectances to determine the thickness of the outer layer. (*See, e.g.*, col. 7, lines 30-67 of Ledger).

However, unlike claim 1, Ledger is silent as to measuring thickness data of the insulating layer and making a library by matching the measured thickness data and the optic image collected on a same location on the substrate. Ledger merely discloses calculating reflectance data for a plurality of assumed or arbitrary thicknesses of the outer layer. (*See, e.g.*, col. 7, lines 30-45 of Ledger). The calculated reflectance data and the corresponding assumed thickness may be arranged in a library that may be used to determine a thickness of the outer layer by comparison with the measured reflectance data. (*See, e.g.*, col. 8, lines 1-5 of Ledger). Thus, Ledger differs from the invention of claim 1 in that Ledger does not measure any thicknesses at all and does not create a library by matching measured thicknesses and collected optic images. In Ledger, the only data that are measured are the reflectance data. However, these measured reflectance data are not part of the library. Ledger's library, unlike claim 1, merely includes mathematically calculated reflectance data and corresponding assumed or arbitrary thicknesses of the outer layer.

Yagi fails to remedy the deficiencies of Ledger. Yagi merely relates to an optical polishing apparatus that includes an endpoint detector device that measures the thickness of a film that is being polished. (*See, e.g.*, col. 2, lines 38-53 of Yagi). However, Yagi is silent as to creating a library by matching measured thickness data and the optic image collected on a same location on the substrate. Accordingly, any reasonable combination of Ledger and Yagi cannot result, in any way, in the invention of claim 1.

The Examiner maintained that "it would have been obvious to one of ordinary skill in the art ... to inspect the insulating layer of a wafer to ensure that the insulating layer is planar to ensure a lack of dielectric breakdown and low leakage current in the wafer." Applicant respectfully disagrees for at least the same reasons provided in the Amendment of July 27, 2006. Yagi is merely concerned with determining the thickness of the substrate but is not concerned with obtaining optic image data of the polished substrate. Yagi's measurements are merely intended to ensure that the planarization of the insulating layer provides a substantially uniform thickness layer. There is no need in Yagi to use optic image data since Yagi's thickness measurements are done concurrently with the polishing of the wafer surface (*i.e.*, without the possibility of collecting optic image data of the insulating layer since the polishing pad is in contact with the surface of the insulating layer). As such, in the absence of impermissible hindsight based on Applicant's own specification, there is no reason as to why one of ordinary skill in the art would be motivated to modify Ledger's teachings in view

of Yagi in order to provide a library in which the color image data of an insulating layer is matched with the thickness data of the insulating layer.

Claims 2-5 are patentable over Ledger, Yagi and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 6 is patentable over Ledger, Yagi and a combination thereof for at least similar reasons as provided above for claim 1 and for the features recited therein. Specifically, claim 6 is patentable over Ledger, Yagi and a combination thereof at least because this claim recites a method for inspecting an insulating layer deposited or planarized on a substrate in fabrication processes of semiconductors with a library of optic images, the method comprising, *inter alia*, measuring a thickness of the insulating layer at a plurality of locations on the substrate; collecting an optic image of the insulating layer for each of said plurality of locations on the substrate; correlating the optic image to the measured thickness of the insulating layer for each of said plurality of locations; and creating a library by matching the optic image to the measured thickness of the insulating layer for each of said plurality of locations.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-6 under 35 U.S.C. §103(a) based on Ledger in view of Yagi are respectfully requested.

Claim 7 is newly added to define additional subject matter that is novel and non-obvious over the art of record. Claim 7 is patentable over the art of record for at least similar reasons as provided above for claim 1 and for the features recited therein. Accordingly, claim 7 is in condition for allowance.

Applicant has addressed the Examiner's rejection and respectfully submits that the application is in condition for allowance. A notice to that effect is earnestly solicited.

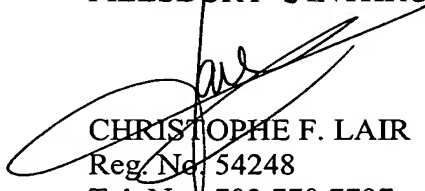
If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

KANG -- 10/756,770
Attorney Docket: 025403-0307595

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



CHRISTOPHE F. LAIR
Reg. No. 54248
Tel. No. 703.770.7797
Fax No. 703.770.7901

CFL/smm
P.O. Box 10500
McLean, VA 22102
(703) 770-7900